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TECHNOLOGY WHICH MAY BE SUBJECT TO SECTION 22 OF
THE PATENTS ACT 2004

The following is a list of technical areas which is that currently notified to the Comptroller by the Secretary of State for Defence as being information the publication of which might be prejudicial to national security. This list is for internal use, only by the UK Patent Office.

Directions under section 22 may be issued in respect of any technology falling under any of the categories listed, but information which falls into any of the categories listed will not automatically attract such directions. The Secretary of State reserves the right to add to the categories.

For the purposes of section 23, permission to file abroad is necessary for applications containing information which relates to military technology regardless of whether such technology falls within any of the categories listed.

1. Atomic Energy

- a. Nuclear weapons or nuclear explosives of any kind, including their components such as neutron generators.
- b. Methods of detecting nuclear explosions or atomic energy plant.
- c. Nuclear reactors or other nuclear devices or processes for military purposes, eg for the propulsion of naval vessels or submarines.



- k. Treatment of uranium to increase the proportion of the isotope 235 contained in the uranium, including equipment and software specifically designed or adapted (or, if not so designed or adapted, likely to be of exceptional use) in this connection. (See also Uranium Enrichment Technology (Prohibition on Disclosure) Regulations 2004).

2. Airborne Anti-submarine Warfare (ASW)

- a. Underwater detection of targets, including new frequency bands and modes of operation.
- b. Software associated with special algorithms for detection, classification and location of underwater sonar targets.
- c. Sonobuoy location systems (with special frequency, accuracy or mode of operation).

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3. Military Aircraft and Helicopter Construction and Design (*Excluding* sailplanes, or minor features not connected with armament or performance, and *excluding* civil aircraft of all types)
 - a. Aircraft.
 - b. Helicopters.
 - c. Remotely piloted vehicles.

4. Aircraft Engineering
 - a. Retarding devices on aircraft (*Except* designs of wheel brakes and brake parachutes).
 - b. Air conditioning systems using other than air for heat transfer fluid.
 - c. Measures to reduce vulnerability of aircraft to enemy action.
 - d. Complete flight refuelling systems (*Not* Flight refuelling components such as valves, hoses, nozzles etc.).
 - e. Aircraft escape systems (*Except* parachutes).
 - f. Inert gas purging and explosion suppression of fuel tanks and other spaces liable to contain inflammable vapour.
 - g. Active control systems to prevent flutter and reduce loads on aircraft structures.
 - h. Reduction of helicopter vibration.
 - i. Ice detection and de-icing systems. Methods of icing protection for helicopters.
 - j. Undercarriage design and components for reducing aircraft response to rough ground taxiing loads such as shock absorbers.
 - k. Fire detection and extinguishing systems.
 - l. Erosion resistant radomes.
 - m. Enhancement of radome performance, especially for very wide frequency operation or angle of incidence.

5. Aircraft Launching, Take-off and Landing Devices
 - a. Launching manned or unmanned aircraft including
 - i) Boosting devices and methods of increasing thrust and lift at take-off, other than by increasing engine power;
 - ii) Catapults for launching manned or unmanned aircraft;
 - b. Aids to landing or retarding aircraft on landing including arrester gear.

6. Airfields, Runways, Landing Decks and Tracks
 - a. Take off or Landing surfaces, including
 - i) Flexible surfaces
 - ii) Those with special shock absorbing abilities
 - iii) Surfaces impervious to jet down-thrust gases
 - iv) Surfaces capable of rapid laying
 - v) Surfaces effective on soft ground or water, or
 - vi) Any surface which involve radical changes in existing landing or take-off techniques.

7. Armour and Protective Devices
 - a. Armour, including body armour of metal, plastic fabric or other materials or combination of materials for protection against enemy action or terrorists.
 - b. Protective devices to minimise the effect of enemy action, such as devices for sealing tanks or protection against fire.
 - c. Shelters against nuclear blast and fall-out.

8. Alloys, Ceramic Materials and Coatings
 - a. High temperature alloys.

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- b. Alloys possessing resistance to erosion, creep, fatigue or mechanical shock at elevated temperatures

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- d. Alloys with high strength to weight ratios, fatigue to ultimate tensile strength ratios fracture toughness, stress corrosion resistance or Young's Modulus.
e. Alloys selected for their electrical or magnetic properties, such as to permit weight reduction or other improvements in components.
f. Hard alloys having a density greater than 13 grams per cc.
g. Alloys stated to economise in strategic materials (ie those likely to be in short supply in times of emergency), but giving a performance equal to those using larger quantities of such materials.
h. Any ceramic, alloy or metal ceramic material where reference is made to its use for specific military purposes, including guided missiles and rockets.

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- j. De-icing and anti-icing coatings for aircraft and helicopter equipment.

9. Camouflage

- a. Camouflage, decoy and deceptive devices including materials capable of absorbing, reflecting or dissipating electro-magnetic or infra-red radiation.

10. Catalysts

- a. Catalysts for hydrogen peroxide breakdown.

11. Chemical and Biological Warfare

- a. Chemical compounds of high toxicity;
b. Methods of disseminating chemical agents (including the generation of very fine aerosols);
c. Methods of production, storage, dissemination and detection of pathogenic micro-organisms, their toxin products.
d. Methods of production, storage, dissemination and detection of toxins derived from sources not falling under c.
e. Methods and devices for protecting personnel against chemical and/or biological warfare including antidotes.
f. Detection and Alarm devices.

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12. Clothing

- a. For surmounting obstacles or protection against injury eg anti-mine shoes.
b. For protecting against Nuclear, Biological and Chemical Warfare (NBC).

13. Controls, Power Operated

- a. Power Operated controls including active control techniques and servo systems.
b. Highly accurate rate gyroscopes and those with fast reaction times.
c. Methods of transmitting data with high accuracy and response.
d. Schemes for achieving high reliability, integrity and survivability in active control

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- d. Stable generation, modulation or amplification and associated techniques.
- e. Oscillators with stability better than a few parts per million per year.
- f. Circuits for secure means of communication.
- g. Micro-wave power oscillators and amplifiers (*Except* Magnetic amplifiers for power lines), offering:
 - i) High peak power output
 - ii) High average output power
 - iii) High instantaneous band-width
 - iv) High tunability
 - v) Low noise
 - vi) High operating temperature
 - vii) Small size, and/or
 - viii) High ruggedness.
- h. Miniature rugged devices capable of use in shells, bombs or rockets.
- i. Systems and devices for detecting and amplifying small microwave signals and having very low noise, very wide band-widths or very large dynamic range;
- j. Systems or devices having special features to reduce the effect of atomic acoustic or intense electro-magnetic radiation, including protection of micro-wave receivers against very high incident mean power.
- k. Equipment for detection of low-level ELF (extra low frequency) and ULF (ultra low frequency) electro-magnetic fields.

19. Communication, Signaling, Navigation, Identification and Direction Finding

- a. Countermeasures including jamming and anti-jamming devices, jamming simulators
- b. Any form of signaling, including spread spectrum, claiming to give a degree of immunity from natural and man-made interference.
- c. Navigation, Tracking and/or and Direction Finding (*Except* Low accuracy navigation systems).
- d. Navigation devices of high accuracy with errors of a few metres, including navigation on land;
- e. Rallying aids for airborne troops on ground;
- f. Beacons including droppable sonobuoys;
- g. Direction finding systems operating above 500MHz;
- h. Apparatus for characterising and locating short-duration transmissions
- i. Applications of ionospheric and tropospheric scatter or absorption band transmission to communications;
- j. Data telemetering systems;
- k. High definition facsimile or television transmission systems, especially when small enough for use in aircraft or weapons;
- l. Systems employing spread-spectrum or frequency hopping (agile) and high speed or burst transmission techniques;
- m. Search, panoramic and recording receivers;
- n. Military identification devices or techniques.

This class includes both electronic and non electronic methods and devices.

20. Opto-electronics, infra- red and other non visible systems

- a. Reliable and secure optical systems for communications
- b. Holographic optical components. (Not Telecommunication components, optical encoders such as for use in machine tool control systems)
- c. Methods and devices to detect and/or intercept optical signals or communications
- d. Communications or surveillance systems using non-visible parts of the spectrum;
- e. Infra-red and other non visible target detectors and vision aids;
- f. Infra-red and other non visible radiation detection cells, photo-electric and otherwise
- g. Pre-detection and post-detection filters, including both optical and digital transformation and filtering techniques capable of enhancing the ability to distinguish a target from background clutter, including design and manufacture.
- h. Means for suppression of infra-red radiation, other than structural or camouflage.

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- i. Infra-red and other non-visible radiation transmitting window material.

21. Engineering Equipment

- a. Assault, defence and demolition devices;
- b. Systems for covert entry;
- c. Lock (physical or electronic) picking devices;
- d. Systems to defeat surveillance systems;
- e. Systems for rapid embarkation and disembarkation of troops;
- f. Illumination for night photography (including illumination or flash systems using non-visible parts of the spectrum);
- g. Bridging;
- h. Amphibious equipment;
- i. Temporary harbours;
- j. Barriers such as tank traps.

22. Engines, Prime Movers and Propulsion

- a. Gas turbines, ram-jet and rocket motors including those using liquid fuels.
- b. Improvements in any of the following:
 - i. Specific fuel consumption.
 - ii. Specific thrust
 - iii. Weight
 - iv. Life
 - v. Reliability
 - vi. Cooling techniques
 - vii. Fabrication techniques applied to engines specified at "a".
- c. Variable intake and exhaust nozzles.
- d. Variable shape transonic and supersonic compressors and compressors containing unique features for supersonic flight.
- e. High heat release and high velocity combustion systems. Combustion and fuel systems for other than liquid hydrocarbon fuels.
- f. Features enabling turbine entry gas temperatures above 1500K or re-heat boost temperatures above 1800K to be sustained in a gas turbine.
- g. Control systems of advanced design eg where the intake and nozzle areas are variable and inter-related to the engine and/or aircraft speed.
- h. Control systems pertaining to jet-lift, jet-flap or flap-blowing.
- i. Fuels and oxidants for missiles.
- j. Methods of containing rocket fuels and oxidants in missiles and of delivering them to the engine.
- k. Devices for assisting combustion ignition in flight.
- l. Infra-red and radar suppression devices.
- m. Ship and boat engine silencing devices.
- n. Devices or techniques for improving the power to weight ratio of naval propulsion machinery of 1 MW and over, including those for thrusters and low-speed drives.
- o. Non-magnetic machinery.
- p. Means for vectoring or reversing thrust in flight.

23. Explosives and Propellants

Propellants, high explosives, detonating initiation and delay compounds, detonators, shaped and stranded charges, fuze compositions, plastic explosives. (*Except* Blasting and mining explosives.)

24. Fighting Vehicles

- a. Tanks, armoured and other fighting vehicles including bridge laying.
- b. Floatation and wading devices.

25. Fire-control for Gunnery and Attack by Missiles

- a. Predictors, directors, fire-control gear, bomb sights, bombing computers and other aiming and sighting devices.
- b. Gun control equipment eg for stabilising guns in vehicles and ships.

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26. Fuzes and Initiating Devices

- a. Devices for initiating the operation of munitions.
- b. Anti-handling and disturbance devices.
- c. Proximity fuzing.


27. Guided Missiles and Unmanned Vehicles

Guided missiles and unmanned vehicles and associated equipment. Guidance systems whether active or passive, over any part of the flight.

28. Infra-red

- a. Infra-red target detectors and vision aids, infra-red radiation detection cells, photo-electric and otherwise. Pre-detection and post-detection filters, including both optical and digital transformation and filtering techniques capable of enhancing the ability to distinguish a target from background clutter, including design and manufacture.
 - b. Means for suppression of infra-red radiation, other than structural or camouflage.
 - c. Infra-red transmitting window material.
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29. Instruments Computers etc.

- a. Instruments capable of measuring or recording time events of one millisecond or less, muzzle velocity measuring equipment, propellant pressure recorders.
- b. Very high precision time interval devices.
- c. Range finders.
- d. Periscopes and associated equipment including periscope sextants and automatic periscope bearing transmitters.
- e. Astro-navigation, automatic sextants, star following, precision gyroscopes and gyro techniques aimed at wander rates of below 0.1 degrees per hour.
- f. Automatic pilot and stabilising equipment for aircraft and guided missiles, coupling arrangements between autopilots and bombing or navigation or landing approach and terrain following systems.
- g. Landing approach aids.
- h. Indicators capable of measuring true air speed above 550 mph.
- i. Mach-meters where performance of aircraft is specifically mentioned.
- j. Navigational devices of high accuracy, giving position within a few metres.
- k. Air mileage units.
- l. Accelerometers of accuracy better than $10^{-3}g$.
- m. Turn-sensitive devices for radar and gun stabilisation, or for stabilisation of mountings and for auto-pilots and auto-stabilizer
- n. Hardware and software specially designed for:
 - i) Modelling, simulation or evaluation of military weapon systems
 - ii) Development, monitoring, maintenance or updating of software embedded in weapon systems
 - iii) modelling or simulating military operation scenarios
 - iv) Command, Communications, Control and Intelligence (C³I) applications or Command, Communications, Control, Computer and Intelligence (C⁴I) applications
 - v) Determining the effects of conventional, nuclear, chemical or biological warfare weapons.
- o. Computer systems or software specially adapted for military or intelligence purposes. (*Not* Computers of commercial type)
- p. Airborne digital computing system architectures designed to achieve high integrity and survivability, particularly in relation to critical flight safety functions such as stores management and flight control.
- q. Inertial navigation and flight systems using high accuracy components.
- r. 
- s. Gravity gradiometers with an accuracy better than 10EU.

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- t. Head up displays.
30. Internal Security and Counter Insurgency
- a. Weapons, chemicals and devices for the control of crowds.
 - b. Methods and devices for the detection of NBC materials, weapons and explosives.
 - c. Methods and equipment for the disruption or making safe of explosive devices.
 - d. Specialist surveillance devices.
 - e. Devices aimed at intruder detection such as radar, infra-red or seismic detectors.
 - f. Communication equipment claiming to be tap or tamper proof.
 - g. Devices and measures to prevent or/detect the counterfeiting of money (including banknotes) and of other valuable financial instruments.
- [REDACTED]
31. Directed Energy Devices
- a. Laser weapons and components.
 - b. Other directed energy devices and components.
32. Mines and Explosives
- a. Mines and explosive devices including beach and sea mines.
 - b. Laying devices for above.
 - c. Detectors for non-magnetic mines (*Not* Metallic mine detectors).
33. Nuclear Power
Nuclear propulsion plant for ships and associated equipment.
34. Ordnance, Projecting and Launching of Missiles
- a. Guns and their ammunition (*Except* Sporting guns and sports equipment).
 - b. Missile launchers, release and projecting devices including rocket projectors.
 - c. Unguided missiles including shells, bombs, torpedoes and rockets (*Not* Distress signal and rescue projectors).
 - d. Gear specially designed for handling munitions including equipment on aircraft for suspension and housing.
 - e. Anti-armour munitions and improvements in conventional, sensing, and terminal guided munitions and submunitions.
35. Plastics, Rubbers and Glasses
- a. Plastics and rubbers containing oxygen furnishing groups such as nitrate, nitro, nitroso, chlorate, perchlorate and the like, mainly of interest in propellants and explosives.
 - b. Reinforcing material or compounding ingredient for plastics or rubbers, eg inorganic fibres or stabilisers., which will give a high strength to weight ratio, or which provide chemical and thermal stability at temperatures above 200C.
 - c. Plastics or rubbers having good chemical and thermal stability above 250C and substantial retention of mechanical properties above 200C together with:
 - i. Good dielectric properties above 200°C or useful semi-conductive properties, or
 - ii. Good chemical resistance such as ability to withstand fuming nitric acid, High Test Peroxide (HTP) or other rocket fuels and, in the case of rubber, having good resistance to fuels, lubricants and hydraulic fluids above 200C or below -40C.
 - d. Coatings having outstanding resistance to rain erosion in flight.
 - e. Anti-corrosion coatings and sealing compounds stable at 200C and above.
 - f. Metal-metal or metal-ceramic adhesives having high strength above 200C and with good creep, fatigue, chemical and climatic resistance
36. Radiological Equipment (*Not* Medical X-ray equipment, Linear accelerators, Xeroradiographic equipment.)
- a. Flash X-ray tubes.
 - b. Flash generators
37. Naval Ships, Boats and their Equipment

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- a. Ship hull forms.
 - b. High speed marine craft.
 - c. Booms and nets for use as a defence against surface and underwater craft.
 - d. Drag reducing designs and devices for use in waterborne and underwater vehicles.

 - e. Means of changing ships acoustic signature.
 - f. Means of reducing ships motions.
 - g. Means of improving ships manoeuvrability.
38. Smoke, Flame and Incendiary Equipment
- a. Smoke screening both visual and infra-red, smoke markers, composition and methods of stabilising. (*Not* Equipment for generating smoke.)
 - b. Flame throwers, incendiary agents and gelled fuels.
39. Supply Dropping
- a. Homing, guidance, control or orientation of parachute loads (freight or personnel containers), decelerating devices using rockets or other means.
 - b. Safety accommodation provision for personnel containers.
 - c. Landing shock absorber systems. Detachment devices for parachute after landing. (*Not* Parachutes)
 - d. Systems governing accuracy of aim from high altitudes.
 - e. Aids for location of stores dropped by parachute.
40. Military Survey and Photographic Equipment (*Except* Stereoscopic mapping equipment.)
- a. Quick survey, (including air survey and photo interpretation) reconnaissance, including systems using radio, radar, television and other equipment transmission techniques.
 - b. Missile recording cameras:
 - i. Multi-lens type
 - ii. Strip type
 - iii. Cine, ultra high speed, or
 - iv. Night and high speed aerial photography.
 - c. Improvements in resolving power of aircraft cameras, including the use of illuminants of greater efficiency.
 - d. Low light and night photography.
41. Target Location
- a. Laser systems for ranging.
 - b. Systems which are intended to assist weapon location and identification on the battlefield.
 - c. Detection of laser sources and laser beams.
42. Training Devices
Training devices for equipment not having civilian applications.
43. Underwater Craft, Weapons and Devices
- a. Submarines and their equipment.
 - b. Underwater vehicles including midget submarines, manned and unmanned submersibles, swimmer delivery vehicles, underwater swimming devices and human torpedoes.
 - c. Underwater propulsion systems.
 - d. Systems for the surveillance, detection and location of underwater vessels, weapons and objects.
 - e. Countermeasures and counter-countermeasures against underwater vessels and weapons including anti-torpedo weapons and devices, anti-mine devices and methods for deploying them, including anechoic coatings, confusion and deception devices.
 - f. Torpedoes and underwater launched missiles including homing systems, power sources motors, engines and propulsors for them, also their launching, guidance and fire control systems. Surface launched missiles for deploying torpedoes.

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- g. Sea mines and their sensors and actuating devices, including equipment for fusing, setting, laying and mooring them.
- h. Mine-sweeping and mine countermeasures equipment including devices for locating mines, rendering them harmless, recovering or destroying them.
- i. underwater explosives, projectiles, depth-charge and thrown weapons including launching and fire control equipment for them.
- j. Limpet mines and like devices for attachment to underwater surfaces.
- k. Shallow water diving equipment.
- l. Underwater communications by acoustic means.